Estimating $\log_{10} a$ with bisection (Ver. 1)

We can estimate $\sqrt{a}$ by bisection following these steps

1. Give L = 0, U = a
2. The answer is in range [L, U]
3. x = the middle point between [L, U]
4. looping these steps below, if x^2 is not close to a. "Close" is when $|a - x^2| \leq 10^{-10}\max(a, x^2)$
   - if $x^2 > a$ change the range to [L, x]
   - if $x^2 < a$ change the range to [x, U]
   - x = the middle point of the range
5. x is the estimation number of $\sqrt{a}$

Input

A real number a (a must be between 1 to 600).

Output

Estimation of $\log_{10} a$, where $a \geq 1$ round to 6 decimal places.

Example

Input (from keyboard)	Output (on screen)
1	0.0
100	2.0
250.0	2.39794
500.0	2.69897